REMARKS

Claims 1, 17, 18, 20, 27, and 28 have been amended to address certain formal aspects. New claims 37 and 38 have been added. No new material has been added. Please enter the amendments and consider the following remarks prior to further examination.

Discussion of Rejections Under 35 U.S.C. § 112

In the Office Action, Claim 27 is rejected under U.S.C. § 112 as being incomplete and for using an unacceptable form of an alternative expression. Claim 27 has been amended to address these issues.

Discussion of Rejections Under 35 U.S.C. § 102(e)

In the Office Action, Claims 17, 18, 32, and 33 are rejected under U.S.C. § 102(e) as being anticipated by Raab *et al.* (US 6,935,036). Raab discusses a coordinate measurement machine (CMM) having modular bearing/encoder cartridges.

Raab, however, does not disclose all of the features of Claims 17 and 18. For example, Raab does not teach a method of virtually measuring a physical object, where the method includes performing an evaluation of a stored cloud of points virtually representing the physical object.

As is understood in the field of metrology an "evaluation" is an assessment of an object which provides detailed information as to, for example, the circularity of an aperture, or the trueness of a square groove which might be expressed as a percentage of compliance or deviation - see application as published (US 2007/0032901 Al) at [0077]. An evaluation macro provides instructions for particular movements by the measurement probe to examine, for example, only an aperture, groove, or some other feature in detail, and to perform calculations thereon.

In contrast, Raab teaches that a CMM can be used to compare points on a object with CAD data. This action would not be considered by one of ordinary skill in the art as an evaluation.

In addition, the comparison performed in Raab is based on measurements made from an object currently in the machine. There is no indication in Raab that a cloud of points virtually representing a physical object is *stored.*

Accordingly, Applicant respectfully submits that Claims 17 and 18 are patentable over Raab. In addition, Applicant does not necessarily agree with the characterizations of Raab with respect to the dependent claims, and respectfully submits that the dependent claims are in condition for allowance because of the features which they inherit from the independent claim from which they each depend and for their own features.

Discussion of Claims Rejected Under 35 U.S.C. § 103(a)

In the Office Action, Claims 1-16, 19-31, and 34-36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto *et al.* (US 5,291,393) in view of one or more of Michiwaki (U.S. 6,012,022), Kreidler (US 6,954,680), and Rabin *et al.* (US 6,697,948).

Applicant respectfully submits that the combinations of Matsumoto and these other references do not teach all of the features of Claim 1. For example, the combinations do not teach a method of evaluating a physical object, where the method includes generating an evaluation of said physical object by performing instructions of a macro upon the stored numerical representation of the surface of the physical object.

Matsumoto, in contrast, teaches using a macro to either measure a workpiece 40 with a touch sensor 26 or to create a workpiece with a drill. See Column 7, lines 22-32. Accordingly, the macros of Matsumoto are not performed on a stored numerical representation of the surface of a physical object and are not used to generate an evaluation of the physical object.

Furthermore, the Office Action cites Matsumoto et al. at col. 8, lines 35 to 45, which states that Table 3 shows a source work program for producing a new "NC work program" used to machine the circle on the pipe, and FIG. 10, which is a flow chart explaining the production of the NC work program. The source work program described in Matsumoto, however, does not concern an evaluation of an object, as understood in the field of metrology. The source work program of Matsumoto contains instructions to produce an "NC work program" (col. 8, lines 40 to 43) not to evaluate an object. The "NC work program" (e.g. Table 2) is merely a list of surface coordinates and is devoid of instructions to evaluate the object. Thus, Matsumoto et al. at col. 8, lines 35 to 45 discloses a "source work program" that contains instructions to generate an "NC work program," quite unlike the evaluation macro of Claim 1, which has instructions for measurement equipment to perform an evaluation of the physical object. Matsumoto also

discloses the "NC work program" which is merely a list of surface co-ordinates of the object and could also not be considered an evaluation macro.

Furthermore, regarding generating an evaluation of said physical object, the disclosure in Matsumoto et al. at col. 8, lines 35-45 and FIGS. 9, 12 does not mention the generation of an evaluation of the physical object. The first part of the paragraph refers to a pipe having a diameter of 110 mm and a circle that has a diameter of 110 mm which pipe is shown in FIGs. 9 and 12. FIGs. 9 and 12 clearly are schematics of the pipe as a physical object, and the diameters mentioned represent those that are to be cut. Indeed this is confirmed at col. 5; lines 11 and 12, and col. 5, lines 18 to 19 which states the drawings are perspective views of a workpiece to be machined or of an actual machining of a workpiece. Thus, the disclosure in col. 8, lines 35 - 45 regarding FIG. 9 concerns only illustrative examples of machined physical objects, and is entirely unrelated to an evaluation of a workpiece.

The second part of Col. 8, lines 35-45 in Matsumoto states that Table 3 shows a source work program for producing a new "NC work program" used to machine the circle on the pipe, and FIG. 10 is a flow chart explaining the production of the NC work program. Again, it would seem this disclosure is not related to the production of an evaluation report. It is to be remembered that the "NC work program" generated by the source work program in Table 3 of Matsumoto et al. is not the same as an "evaluation report" according to Claim 1. An "NC work program", an example of which is given in Table 2, comprises a list of co-ordinates that merely describes surface shape of an object (Matsumoto et al. column 8, lines 5 to 12). An evaluation report, on the other hand, is an assessment of an object which provides detailed information as to, for example, the circularity of an aperture, or the straightness of a groove which might be expressed as a percentage of compliance or deviation. The "NC work program" in Table 2, in contrast, provides no such assessment information.

Thus, Matsumoto describes the generation of an "NC work program", that is merely a list of co-ordinates, whereas the invention of Claim 1 does not generate such co-ordinates, but may use a mathematical representation of a physical object as input. Further, the invention of Claim 1 generates an output that is an "evaluation of said physical" object which may, for example, be an assessment of the shape and not merely a list of co-ordinates. Therefore, the disclosure in

Matsumoto et al. at col. 8, lines 35 - 45 regarding the generation of an "NC work program" is also entirely unrelated to generating an evaluation of a workpiece.

The Office Action also cites Matsumoto et al. at col. 7, lines 22-32 that describes a CNC machine tool apparatus (FIG. 6a). A spindle is driven by a drive mechanism to move in a three-dimensional space. In generating the "NC work program", the touch sensor is attached. Accordingly, the CNC machine tool apparatus can be adapted to perform an ordinary mapping of the surface of the object. The result is an "NC work program" (e.g. Table 2) i.e. the list of co-ordinates of the object. Furthermore, there is no disclosure that measurement in Matsumoto uses a macro comprising instructions for equipment to perform an evaluation of a physical object, as is found in Claim 1. Such macro may contain, for example, instructions to measure and assess particular features of the object.

Moreover, it is clear that a physical object is measured in Matsumoto since it requires the presence of a touch probe (col. 7, lines 22-32). This is contrary to Claim 1, which specifies that the instructions of the evaluation macro are performed on the stored numerical representation of the surface of said physical object. Thus, Matsumoto at col. 7, lines 22-32 discloses the mapping of the surface of the object, not evaluating the object. Further, the macro of Matsumoto is not an evaluation macro. Moreover, a physical object is measured in Matsumoto, in contrast to Claim 1 which uses a numerical representation of the surface of a physical object.

In summary, the macros described in Matsumoto do not concern the evaluation of an object, contrary to the limitations of Claim 1. Evaluation, as understood in the art includes the measurement and assessment of particular features. To the contrary, the "NC macro command" in Matsumoto contains instructions to produce a "NC work program" (col. 8, lines 5 to 17) not to evaluate an object. The "NC work program" is a list of surface co-ordinates and is devoid of instructions to evaluate the object.

The Office Action cites Matsumoto at col. 12, line 30 to col. 14, line 50, and Tables 1, 2, 3 and 4. These are far from evaluation reports as known in metrology, which are, for example, an assessment of the quality of the object with regard to particular features. Table 1 is a source work program for measuring a circle of the physical object, Table 2 is an NC work program amounting to a list of surface measurements, Table 3 is a source work program for producing a

new NC work program, Table 4 is another NC work program. None of these would be considered by one of ordinary skill in the art as an evaluation report.

Michiwaki describes at col. 5 lines 34 to 50 the DMIS macro language. It explains that the DMIS macro language can be used by measurement devices to move the path of a probe. It discloses that computer generated CAD values are overwritten in a DMIS file with the measured values (Michiwaki, col. 5, lines 43). Michiwaki applies the DMIS evaluation macro in the conventional way to instruct a tangible measurement machine to measure and evaluate a physical object. This use is well known in the art as the present application points out. However, there is no disclosure, suggestion, or hint by Michiwaki of a DMIS evaluation macro being applied to a stored numerical representation of a physical object, as the present invention provides. Since neither Matsumoto et al. nor Michiwaki disclose this feature, Applicant respectfully submits that Claim 1 is patentable over the combination of Matsumoto and Michiwaki.

Furthermore, Applicant does not necessarily agree with the Examiners' characterization of these combinations with regard to the dependent claims, and respectfully submits that the dependent claims are in condition for allowance because of the features which they inherit from the independent claim from which they each depend and for their own features.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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